

## WHAT IS CLAIMED IS:

1. An iron core comprising:  
a stacked structure of a plurality of  
electromagnetic steel plates having a first region in  
5 which an insulating film is formed and a second region  
from which said insulating film is removed by  
machining; and  
a coating member which coats at least the second  
region.
- 10 2. The iron core according to claim 1, wherein  
at least one end face of said stacked structure  
is fixed to a mounting base, and  
said coating member further coats said mounting  
base.
- 15 3. The iron core according to claim 1, wherein  
said plurality of electromagnetic steel plates  
are connected by an adhesive member, and  
said coating member further coats said adhesive  
member.
- 20 4. The iron core according to claim 1, wherein said  
coating member contains at least one of polyimide,  
polyparaxylene, nickel, and amorphous silicon.
5. The iron core according to claim 1, wherein said  
coating member which coats each electromagnetic steel  
25 plate contains at least one of chemical nickel plating,  
zinc phosphate, magnesium phosphate, and manganese  
phosphate.

6. The iron core according to claim 5, wherein a film thickness of said coating member is not more than a film thickness of the insulating film.

7. The iron core according to claim 5, wherein said  
5 coating member further coats a region from which said insulating film on said electromagnetic steel plate is removed by cleaning.

8. The iron core according to claim 7, wherein said coating member coats all surfaces of said  
10 electromagnetic steel plate or of each of said plurality of electromagnetic steel plates.

9. The iron core according to claim 1, further comprising a coil wound around said stacked structure and coating member.

15 10. An alignment apparatus comprising a stator and a movable element opposing said stator, wherein a coil cited in claim 9 is wound around at least one of said stator and movable element.

11. An exposure apparatus comprising an optical  
20 system which projects, onto a substrate, exposure light which illuminates an original having a pattern formed thereon, and an alignment apparatus cited in claim 10.

12. A method of manufacturing an iron core, comprising:

25 a stacking step of forming a stacked structure by stacking a plurality of electromagnetic steel plates having an insulating film;

a machining step of machining at least one side of the stacked structure, the side being formed in the direction that stacks the electromagnetic steel plates ; and

5 a coating step of coating a region from which the side of the stacked structure is machined with a coating member.

13. A method according to claim 12, further comprising a step of fixing at least one end face of  
10 the electromagnetic steel plate to a mounting base, wherein in the coating step, the mounting base is coated with the coating member.

14. A method of manufacturing an iron core, comprising:

15 a stacking step of forming a stacked structure by stacking a plurality of electromagnetic steel plates having an insulating film;

a machining step of machining at least one side of the stacked structure, the side being formed in the  
20 direction that stacks the stacked structure;

a disassembly step of disassembling the stacked structure;

a coating step of coating, with a coating member, a region of the disassembled electromagnetic steel  
25 plates from which the side of the stacked structure is machined; and

a stacking step of forming a stacked structure by

stacking a plurality of electromagnetic steel plates having the coating.

15. The method according to claim 12, wherein in the coating step, at least one of polyimide,

5 polyparaxylene, amorphous silicon, and nickel is used.

16. The method according to claim 14, wherein in the coating step, the region is coated with at least one of chemical nickel plating, zinc phosphate, magnesium phosphate, and manganese phosphate having a film

10 thickness not more than a film thickness of the insulating film.

17. The method according to claim 14, wherein in the coating step, all surfaces of the electromagnetic steel plate or of each of said plurality of electromagnetic

15 steel plates are coated.